Review article/*Artykuł poglądowy*

The influence of cognitive, emotional and social factors on motivation for rehabilitation in patients after stroke

Wpływ czynników poznawczych, emocjonalnych i społecznych na motywację do rehabilitacji u osób po udarze mózgu

Dorota Anita Przewoźnik, Anna Rajtar-Zembaty, Anna Starowicz-Filip

Department of Psychiatry, Jagiellonian University Medical College

Neuropsychiatria i Neuropsychologia 2015; 10, 2: 64–68

Address for correspondence:
Dorota Anita Przewoźnik, MA
Department of Psychiatry, Jagiellonian University Medical College
21 A Kopernika St., 31-501 Krakow
e-mail: dorotaprzewoznik89@gmail.com

Abstract

Aim of the study: Stroke is one of the most common factors causing physical disability. A significant number of people after stroke, although rehabilitated, become disabled to some extent. It is partially caused by physical obstacles. However, in some cases it may be connected with low motivation for rehabilitation, which results in smaller progress made in the rehabilitation process itself and a decrease of the patients' condition and quality of life later on. Therefore, we decided to review the factors affecting motivation for rehabilitation in people after stroke.
Material and methods: In order to determine the factors affecting motivation for rehabilitation in people after stroke, we reviewed the available literature investigating this subject.
Results: Even though there are only a few publications covering the subject of the factors which affect motivation for rehabilitation in people after stroke, all of them show that emotional, cognitive as well as social factors are significant for motivation for rehabilitation, which may affect its outcome.
Conclusions: The level of mobility in persons who have had a cerebral stroke depends on numerous factors. One can and should include here the motivation for rehabilitation, which is, however, often disregarded both in scientific research and in clinical practice. As can be seen from the review of the literature on the subject, the level of motivation for rehabilitation can be affected by the occurrence of post-stroke depression and anxiety, unsatisfactory or excessive social support, lack of awareness of the illness, and cognitive dysfunctions.

Key words: stroke, motivation, rehabilitation, executive functions.

Streszczenie

Cel pracy: Udar mózgu jest jednym z najczęstszych powodów niepełnosprawności fizycznej. Znaczna część osób, które przebyły udar, pozostaje w pewnym stopniu niesprawna mimo prowadzonej rehabilitacji. Częściowo wynika to z przeszkód natury fizycznej, jednak w niektórych przypadkach może mieć to związek z obniżeniem motywacji do rehabilitacji, a przez to zmniejszeniem odnoszonych dzięki niej korzyści i obniżeniem późniejszej sprawności oraz jakości życia chorych. Dlatego też autorzy pracy postanowili dokonać przeglądu czynników mogących wpływać na obniżenie motywacji do rehabilitacji u osób po udarze mózgu.
Materiał i metody: W celu określenia czynników mogących wpływać na motywację do rehabilitacji u osób po udarze mózgu autorzy niniejszej pracy dokonali przeglądu dostępnej literatury dotyczącej tego tematu.
Wyniki: Mimo niewielkiej liczby publikacji obejmujących tematykę czynników wpływających na motywację do rehabilitacji po udarze mózgu wynika z nich, że zarówno czynniki emocjonalne, poznawcze, jak i społeczne mogą mieć znaczenie dla motywacji do rehabilitacji, co może się przekładać również na jej rezultaty.
Wnioski: Poziom sprawności ruchowej osób, które przebyły udar mózgu zależy od wielu czynników. Można i należy zaliczać do nich motywację do rehabilitacji, która jest jednak często pomijana zarówno w badaniach naukowych, jak i w praktyce klinicznej. Jak wynika z przeprowadzonego przeglądu literatury, na motywację do rehabilitacji może mieć wpływ występowanie depresji poudarowej oraz lęku, brak lub nadmierne wsparcie społeczne, brak świadomości choroby oraz dysfunkcje poznawcze.

Słowa kluczowe: udar, motywacja, rehabilitacja, funkcje wykonawcze.

Introduction

Stroke is the first and the most common cause of permanent disability in the adult population (Kozubski and Liberski 2008). Approximately 60-70% of patients after stroke reveal varying degrees of disability within a month after the vascular incident. After two months, about 60% of patients continue to struggle with lower efficiency. However, after one year, approximately 50% of patients remain disabled (Wiebers

et al. 2006). Higher cognitive function symptoms are observed among approximately 33-50% of patients after stroke (Kozubski and Liberski 2008). Due to the stroke, damage to brain structures may also leave negative traces in patients' emotional and social functioning (Seniów 2013).

Although rehabilitated, many patients after stroke become permanently disabled to various degrees. It is an extreme burden for both patients and their families. Clinical observation in rehabilitation centres shows that patients after stroke differ significantly from each other in terms of motivation and willingness to take up daily rehabilitation struggles, as well as to perform various exercises. Although all patients subjected to rehabilitation should make a maximum effort to continue their recovery process, the degrees of their therapeutic involvement varies.

Medical staff often meet individuals after stroke who are quite passive at restoring their efficiency or their efforts in this respect are not sufficient despite a realistically assessed possibility to recover their health to a degree satisfactory enough for them to function independently. Specialists are trying to increase the benefits derived from rehabilitation by, inter alia, testing new rehabilitation methods, often simultaneously with applying standard rehabilitation. Strategy training is an example of such an activity that involves the patient in making decisions in the scope of the type and course of exercises. This method assumes that the patient himself/herself is able to identify problems in his/her daily functioning, defines his/her own objectives, and controls and evaluates their attainment (Skidmore *et al.* 2015). The results of such actions are promising and productive in the testing phase. However, one has to bear in mind that motivation for rehabilitation is a complex phenomenon that can be affected by various factors.

Motivation for motor rehabilitation

Cognitive and emotional problems are common after stroke (Pohjasvaara *et al.* 2002; Thomas and Lincoln 2006; Nys *et al.* 2006) and may decrease motivation to participate in rehabilitation by limiting the ability to understand instructions, perform recommended exercises or systematically implement recommendations into everyday life. Some studies suggest that stroke patients' initial efficiency level may serve as a predictor for subsequent functioning (Skidmore *et al.* 2010). However, very little is known about the impact of other factors such as patients' emotional state, their executive dysfunctions or social support perceived by patients.

Post-stroke rehabilitation is defined as a process which supports optimal recovery and life activity of a person whose overall efficiency has been limited due to stroke. Its components include physical restoration (restoration), improvement of functioning without changing basic body functions and activity (compensation), modifying the direct environment of the person affected (environmental modification), preventing complications which may occur after stroke (prevention), as well as preventing deterioration of the patient's health (maintenance). The patient's mental health is an important issue, but the greatest emphasis is attached to providing optimal life quality (Gresham *et al.* 1997). Referring to the European guidelines, rehabilitation should begin as soon as possible and should be continued to the point where the patient's condition improves (Olsen *et al.* 2003). Therefore, it is a long process requiring both financial efforts and commitment on the part of the staff, patient's relatives and the patient himself/herself. It has already been mentioned that lack of adequate rehabilitation motivation is a common problem shared by specialists overseeing treatment. A study conducted in patients after stroke distinguished between individuals with high and low levels of motivation. The study demonstrated that highly motivated patients were aware of the importance of their active participation in rehabilitation, as it leads to a significant improvement in their condition. In contrast, people with low motivation for rehabilitation declared that the staff were very caring, and that is why they showed lower commitment to achieving fast recovery (Maclean *et al.* 2000). The result is that the level of social support experienced can bring both positive and negative effects.

Polish studies referring to motor rehabilitation motivation suggest that problems with motivation appear especially among elderly patients, i.e. the group with the highest risk of stroke. This test was founded on the Elderly Motivation Scale use (EMS-72), based on Ryan and Deci's theory of self-determination, which distinguishes between internal and external motivation, self-determined external motivation and amotivation. This study showed that intrinsic motivation, which is attributed to greater commitment and grit, decreases with ageing. Ageing also causes an increase of amotivation, i.e. a lack of willingness to act. The survey results indicate a positive correlation between intrinsic motivation and determinants of success in rehabilitation approved for the survey. They

are as follows: self-determined health condition and life quality, as well as the intention to continue exercising (Pilch 2011). Moreover, strongly motivated patients are more likely to take full responsibility for their rehabilitation and its recovery results (Røe *et al.* 2008).

Cognitive factors and motivation for rehabilitation

Executive functions, including cognitive skills of higher order, are quite significant in motivation for rehabilitation. Baddaley was the first scientist to introduce the idea of executive functions, by expressing them as a mechanism controlling mental processes such as dredging up data, coding the data into long-term memory and performing mental operations on it (Kolan 2011). Currently, executive functions are attributed to a slightly different role. Maloy and De Natale understand them as functions managing setting goals, creating alternative opportunities to respond to the stimulus, control, and correction and modification of behaviour influenced by changing conditions (Pąchalska 2012). Additionally, postponing response, cognitive flexibility and self-control are also included in executive functions (Jodzio 2008). Executive dysfunctions affect many aspects of rehabilitation, including balance, mobility, everyday activities, as well as the level of participation in rehabilitation. Skidmore *et al*. invented a research tool to examine the relationship between executive functions' efficiency and their impact on participation in rehabilitation. The research revealed that impaired executive functions and depressive symptoms significantly decreased the level of participation in rehabilitation (Skidmore *et al.* 2010). Moreover, patients whose executive functions work improperly may also have problems understanding instructions, planning, initiating and completing a rehabilitation program and controlling errors. In turn, it may result in reducing treatment results. Furthermore, impairment of cognitive functioning is associated with a higher mortality rate, greater probability of institutionalization and increased cost of post-stroke treatment (Cumming *et al.* 2013).

Another factor which may affect the weakening of after-stroke rehabilitation motivation is the absence of disease awareness. This phenomenon is called anosognosia and occurs more often in right hemisphere brain damage. The term "anosognosia" was first used by Babinski in 1914 and referred to the absence of cognitive impairment awareness, visual disturbances and physical disability (Bogousslavsky and Cummings 2000). Anosognosia patients are hospitalized longer and after returning home show less activity in the context of daily activities (Jehkonen *et al.* 2006). Additionally, individuals with this disorder, unable to notice their limitations, often undertake actions which may sometimes be dangerous for them. Blind to the need of therapeutic intervention, anosognosia patients refuse to participate in rehabilitation (Hartman-Maeir *et al.* 2001).

If the patient is aware of his/her health damage, it may be particularly important to locate the patient's control over health. There is no research indicating that the health locus of control has an impact on post-stroke rehabilitation. However, it can be assumed that the internal health locus of control or a sense that, to some extent, the health level depends on the patient, may result in greater motivation for rehabilitation.

Emotional factors and motivation for rehabilitation

Anxiety disorder is the most common mental disorder on a global scale. A recently published study reported that there is a 20% incidence of anxiety disorder one month after the stroke, 23% one to five months after the stroke and 24% after half a year (Burton and Murray 2013). Anxiety disorder after stroke is most often of general nature. However, it sometimes takes a more severe form, regarded as post-traumatic stress disorder (PTSD) symptoms. Post-traumatic stress syndrome is defined as a response to an occurring factor-event which goes beyond the scope of ordinary human suffering. Stroke is for many patients an event that alters their past lives and significantly affects their loved ones. Post-traumatic stress disorder symptoms include re-playing the trauma, avoiding thoughts, feelings and behaviours reminiscent of the trauma, as well as pertinacious symptoms of increased arousal occurring for instance in the form of a persistent and inappropriate fear for one's safety (Dobrzańska-Socha 2013). A study covering 61 patients after their first vascular incident revealed 9.8% of results indicating the presence of PTSD, wherein the vast majority of respondents stated they had never experienced any traumatic event before the stroke. Although the percentage of people meeting the criteria for PTSD in this study was quite low, it was still significantly higher than that found in the population, i.e. 1-2% (Sembi *et al.* 1998). Another researcher came to a very similar conclusion, indicating that PTSD

appeared ten times more often among people after transient ischemic attack (TIA) than in the general German population. Moreover, post-traumatic stress occurring three months after TIA was associated with maladaptive strategies of coping with health problems (Kiphuth *et al.* 2014). After the meta-analysis of the available publications on PTSD after stroke and TIA, Edmondson and his colleagues proved that it is possible, based on the data, to estimate these disorders' appearance within the first year after stroke, as well as after over a year (for 23% and 11% respectively) (Edmondson *et al.* 2013). It is significant that emotional support, staying in a partnership or marriage, as well as older age may have a protective effect on PTSD development among patients after stroke and TIA (Goldfinger *et al.* 2014).

Post-stroke depression may be another emotional factor affecting motivation for rehabilitation. Depending on the tools applied and diagnostic criteria, it was classified as post-stroke depression among 16-72% of patients. Greenberg was the first researcher to be interested in the post-stroke depression phenomenon in 1967. Since then, a number of studies have aimed at elucidating this disease's essence (Bour *et al.* 2011; Singh-Manoux *et al.* 2010; Fuentes *et al.* 2009; Robinson 1998). It was proved that the disease occurs in connection with higher cognitive skills, lower efficiency in performing everyday activities and lower results in motor rehabilitation. Post-stroke depression can be severe (about 21% of cases), as well as mild (about 17% of cases) (Tateno and Robinson 2002). What is interesting, both forms of post-stroke depression cause less significant improvement in health as a result of rehabilitation (Chemerinski *et al.* 2001). This fact can be interpreted in various ways. Some authors have suggested it is impossible that depression itself can reduce the benefits derived from rehabilitation. However, depression along with mediators such as weak motivation or social withdrawal can be the cause (Tateno and Robinson 2002).

Social factors and motivation for rehabilitation

Post-stroke rehabilitation covers physical activity suited to the patient's needs. However, disability acquired as a result of stroke often limits the physiotherapy. Mediators influencing physical activity after stroke have been examined. Physical disability acquired as a result of stroke concerns about health and environmental factors are seen as barriers. In contrast, social support and desired ability to perform basic activities of daily living are the positive factors affecting physical activity. Over 40% of respondents complained about the absence of the common factor, which was motivation. Many patients after stroke continue to lead an unhealthy lifestyle, which may trigger another vascular incident. More than 12% of patients after stroke experience another incident within a year (Nicholson *et al.* 2013).

Another study considered the impact of factors such as self-efficiency, social support and perceived barriers on low physical activity among people who have had a stroke, suffer from type 2 diabetes or people suffering from both disorders. The study shows that little social support, low self-efficiency and highly rated perceived barriers strongly affect the low level of physical activity (Adeniyi *et al.* 2012). High social support, particularly examined subjectively by patients, appears to be also important as a protective factor against post-stroke depression development, which, in turn, reduces rehabilitation motivation among patients after stroke (Lewin *et al.* 2013).

Summary

Motor rehabilitation motivation among people after stroke is a very complex issue. There are studies presenting each moderator with an impact on rehabilitation motivation, but there is no research which would help to fully explain this phenomenon. Examining the factors influencing motivation to take part in rehabilitation may broaden the knowledge in this field, as well as enabling early identification and modulation of the factors so that patients could benefit from the assistance provided. These activities may result in a long-term improvement in the efficiency of stroke patients.

References

1. Adeniyi A, Idowu O, Ogwumike O, Adeniyi C. Comparative influence of self-efficacy, social support and perceived barriers on low physical activity development in patients with type 2 diabetes, hypertension or stroke. Ethiop J Health Sci 2012; 22: 113-119.
2. Bogousslavsky J, Cummings J. Behavior and mood disorders in focal brain lesions. Cambridge University Press, Cambridge 2000.
3. Bour A, Rasquin S, Limburg M, Verhey F. Depressive symptoms and executive functioning in stroke patients: a follow-up study. Int J Geriatr Psychiatry 2011; 26: 679-686.
4. Burton CA, Murray J, Holmes J. Frequency of anxiety after stroke: a systematic review and meta-analysis of observational studies. Int J Stroke 2013; 8: 545-559.

5. Chemerinski E, Robinson RG, Kosier JT. Improved recovery in activities of daily living associated with remission of poststroke depression. Stroke 2001; 32: 113-117.
6. Cumming TB, Marshall RS, Lazar RM. Stroke, cognitive deficits, and rehabilitation: still an incomplete picture. Int J Stroke 2013; 8: 38-45.
7. Dobrzańska-Socha B. Sytuacja utraty zdrowia. Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków 2013.
8. Edmondson D, Richardson S, Fausett JK, et al. Prevalence of PTSD in survivors of stroke and transient ischemic attack: a meta-analytic review. PLoS One 2013; 8: 4-9.
9. Fuentes B, Ortiz X, Sanjose B, et al. Post-stroke depression: can we predict its development from the acute stroke phase? Acta Neurol Scand 2009; 120: 150-156.
10. Goldfinger JZ, Edmondson D, Kronish IM, et al. Correlates of post-traumatic stress disorder in stroke survivors. J Stroke Cerebrovasc Dis 2014; 23: 1099-1105.
11. Gresham G, Duncan P, Stason W, et al. Post-stroke rehabilitation. DIANE Publishing, Darby 1997.
12. Hartman-Maeir A, Soroker N, Katz N. Anosognosia for hemiplegia in stroke rehabilitation. Neurorehabil Neural Repair 2001; 15: 213-222.
13. Jehkonen M, Laihosalo M, Kettunen J. Anosognosia after stroke: assessment, occurrence, subtypes and impact on functional outcome reviewed. Acta Neurol Scand 2006; 114: 293-306.
14. Jodzio K. Neuropsychologia intencjonalnego działania. Koncepcje funkcji wykonawczych. Wydawnictwo Naukowe Scholar, Warszawa 2008.
15. Kiphuth IC, Utz KS, Noble AJ, et al. Increased prevalence of posttraumatic stress disorder in patients after transient ischemic attack. Stroke 2014; 45: 3360-3366.
16. Kolan M. Zaburzenia funkcji poznawczych a choroby niedokrwienne mózgu. Neurokognitywistyka w Patologii i Zdrowiu 2011; 94-105.
17. Kozubski W, Liberski PP. Neurologia: podręcznik dla studentów medycyny. Wydawnictwo Lekarskie PZWL, Warszawa 2008.
18. Lewin A, Jöbges M, Werheid K. The influence of self-efficacy, pre-stroke depression and perceived social support on self-reported depressive symptoms during stroke rehabilitation. Neuropsychol Rehabil 2013; 23: 546-562.
19. Maclean N, Pound P, Wolfe C, Rudd A. Qualitative analysis of stroke patients' motivation for rehabilitation. BMJ 2000; 321: 1051-1054.
20. Nicholson S, Sniehotta FF, van Wijck F, et al. A systematic review of perceived barriers and motivators to physical activity after stroke. Int J Stroke 2013; 8: 357-364.
21. Nys GM, van Zandvoort MJ, van der Worp HB, et al. Early cognitive impairment predicts long-term depressive symptoms and quality of life after stroke. J Neurol Sci 2006; 247: 149-156.
22. Olsen TS, Langhorne P, Diener HC, et al. European Stroke Initiative Recommendations for Stroke Management – Update 2003. Cerebrovasc Dis 2003; 16: 311-337.
23. Pąchalska M. Neuropsychologia kliniczna: urazy mózgu. Procesy komunikacyjne i powrót do społeczeństwa. Wydawnictwo Naukowe PWN, Warszawa 2012.
24. Pilch A. Motivational predictors of successful rehabilitation in elderly patients. Physiotherapy 2011; 19: 17-25.
25. Pohjasvaara T, Leskelä M, Vataja R, et al. Post-stroke depression, executive dysfunction and functional outcome. Eur J Neurol 2002; 9: 269-275.
26. Robinson R. The Clinical Neuropsychiatry of stroke: cognitive, behavioral, and emotional disorders following vascular brain injury. Cambridge University Press, Cambridge 1998.
27. Røe C, Dalen H, Lein M, Bautz-Holter E. Comprehensive rehabilitation at Beitostølen Healthsports Centre: Influence on mental and physical functioning. J Rehabil Med 2008; 40: 410-417.
28. Sembi S, Tarrier N, O'Neill P. Does post-traumatic stress disorder occur after stroke: a preliminary study. Int J Geriatr Psychiatry 1998; 13: 315-322.
29. Seniów J. Poudarowe ogniskowe zespoły poznawcze w kontekście rehabilitacji. Zeszyty medyczno-naukowe, Katowice 2013.
30. Singh-Manoux A, Akbaraly TN, Marmot M, et al. Persistent depressive symptoms and cognitive function in late midlife: the Whitehall II study. J Clin Psychiatry 2010; 71: 1379-1385.
31. Skidmore ER, Whyte EM, Holm MB, et al. Cognitive and affective predictors of rehabilitation participation after stroke. Arch Phys Med Rehabil 2010; 91: 203-207.
32. Skidmore ER, Dawson DR, Butters MA, et al. Strategy training shows promise for addressing disability in the first 6 months after stroke. Neurorehabil Neural Repair 2015; 29: 668-676.
33. Tateno A, Robinson RG. The Effect of poststroke depression on recovery from stroke. Psychogeriatrics 2002; 2: 73-84.
34. Thomas SA, Lincoln NB. Factors relating to depression after stroke. Br J Clin Psychol 2006; 45: 49-61.
35. Wiebers DO, Feigin VL, Brown RD. Udar mózgu. Medipage, Warszawa 2006.